SOME IMPACTS OF FUNGAL-FAUNAL INTERACTIONS IN SOIL

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Soils support complex, heterogeneously distributed communities of soil animals and soil microorganisms. While accurate methods are available for comprehensive qualitative studies of the diverse taxa of the soil fauna, such work is impossible for the soil microflora (in spite of the fact that much attention has been given to microbiological methodology). Nevertheless, available information (*e.g.,* Satchell, 1971; Persson *et al.*, 1980) indicates that, at least in temperate ecosystems, the microflora (and fungi in particular) have much greater biomass and contribution to total respiratory metabolism (Reichle, 1977) in soil and litter than do the fauna.

Decomposer activity of the microflora in organic debris is determined by such factors as temperature, moisture regimes, resource quality and quantity, and by the inoculum potential and competitive abilities of the decomposer organisms (Visser, 1985). But activities of the litter fauna (litter grazers, microbivores, detritivores and predators) must be superimposed on those of the microflora and affect:

1. the community structure of the litter microflora.
2. the patterns of decomposition of organic matter.
3. the retention and release of nutrients (attendant on organic matter decomposition).

These effects are brought about in three major ways (Visser, 1985) i.e.

1. by comminution, mixing and channelling of litter and soil: this not only causes increased surface area for microbial colonization but also can lead to a decrease in species richness of fungi and a diversion of their "uccessional patterns."
2. grazing on the microflora: while many studies have indicated that faunal grazing removes only a small proportion of the microbial biomass, selective grazing (when it occurs) can affect microbial community structure and, possibly, organic matter decomposition rates. Grazing also affects nutrient cycling a) by "tying up" nutrients in this faunalbiomass, and, b) by accelerating nutrient release into the soil solution.
3. dispersal of microbial propagules: apart from very specific fungal-faunal relationships (Ingold, 1971) fauna carry (superficially and in their faeces) the cells and spores of a wide variety of saprophytic microbes into new substrates. Therefore microbial community structure and hence organic matter decomposition rates may be substantially affected.

Faunal activities, particularly organic matter comminution, channelling into organic subtrata and soil, and defaecation can significantly affect the micromorphology of the organic layers of soils and, in some cases, the upper mineral horizon *e.g.,* by reduction of particle size of organic matter (with consequent effects on pore volume), by channel formation, and by the

movement of organic matter into the mineral horizons.

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